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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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10/584,776

06/28/2006

Teruaki Yamamoto

043890-0798

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EXAMINER

ARCIERO, ADAM A

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

07/13/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 10/584,776 | Applicant(s) YAMAMOTO ET AL. | |
| | Examiner ADAM A. ARCIERO | Art Unit 1795 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 April 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) 8-10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>06/28/2006; 04/28/2008; 05/06/2008</u> . | 6) <input type="checkbox"/> Other: _____ |

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**NEGATIVE ELECTRODE MATERIAL FOR LITHIUM SECONDARY BATTERY,
NEGATIVE ELECTRODE USING THE MATERIAL, LITHIUM SECONDARY BATTERY
USING THE NEGATIVE ELECTRODE, AND MANUFACTURING METHOD OF NEGATIVE
ELECTRODE MATERIAL**

Examiner: Adam Arciero

S.N. 10/584,776

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July 8, 2010

Election/Restrictions

1. Applicant's election of Group I, claims 1-7 in the reply filed on April 26, 2010 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

The requirement is still deemed proper and is therefore made FINAL. Thus, claims 8-10 are withdrawn from consideration.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.

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3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
4. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimamura et al. (WO/03/079469 using US 2005/0287439 A1 as English equivalent) in view of Nakamoto et al. (machine translation for JP 2000-173612).

As to Claims 1, 3 and 6-7, Shimamura et al. discloses a negative electrode having a negative electrode material for a lithium secondary battery (claims 6-7) which is capable of storing and emitting lithium ions (pg. 3, [0038]). Said electrode material comprises a composite particle including a solid phase A which consists of silicon and a mixed phase B which consists of a transition metal element and silicon (intermetallic compound) (pg. 3, [0038]). Shimamura et al. further discloses wherein the mixed phase is microcrystalline (pg. 3, [0025]). Shimamura et al. does not specifically disclose a carbon material adhered to a part of the surface of the basic material particle and a film having a silicon oxide formed on a surface portion of the base material particle and not on the carbon.

However, Nakamoto et al. discloses that fibrous carbon is fixed over a part of the surface of a negative electrode material comprising a Si composite (paragraph [0016]). At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the electrode material of Shimamura et al. by fixing fibrous carbon (claim 3) to the composite particle, because Nakamoto et al. teaches that even if the particle is expanding and contracting with the occlusion and discharge of lithium, the contact state of each particle and the carbon conducting agent is well maintained, and charge/discharge cycle life is increased (paragraph [0016]). Neither Nakamoto et al. or Shimamura et al. disclose manufacturing the negative

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electrode in a non-oxidative atmosphere (without the presence of oxygen). Therefore, after forming the fibrous carbon particles on the composite particle of Shimamura et al., a natural slow-oxidation treatment will take place, forming a silicon oxide layer on the remaining exposed surface of the basic material composite particle. Furthermore, it is the position of the Examiner that the properties of having a silicon oxide film formed on an exposed surface portion of the composite base material particle is inherent, given that the materials and methods for producing the negative electrode material of the prior arts and that of the present application are the same. A reference with is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. Inherency is not established by probabilities or possibilities. *In re Robertson*, 49 USPQ2d 1949 (1999).

As to Claim 2, Nakamoto et al. teaches of using a conductive agents such as graphite and carbon fibers (pg. 5, [0061]). Nakamoto et al. is clearly teaching that graphite and carbon fibers are considered functionally equivalent for use as conductive agents in negative electrode materials. Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to substitute the graphite of Nakamoto et al. for the fibrous carbon of Shimamura et al., because Nakamoto et al. teaches that they are recognized equivalents.

As to Claim 4, Neither Nakamoto et al. or Shimamura et al. disclose manufacturing the negative electrode in a non-oxidative atmosphere (without the presence of oxygen). Therefore, after forming the fibrous carbon particles on the composite particle of Shimamura et al., a natural slow-oxidation treatment will take place, forming a silicon oxide layer on the remaining exposed surface of the basic material composite particle. Furthermore, it is the position of the Examiner that the properties of having a silicon oxide film wherein the amount of the film is at least 0.1

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wt% and at most 1.0 wt% silicon in terms of oxygen amount, formed on an exposed surface portion of the composite base material particle is inherent, given that the materials and methods for producing the negative electrode material of the prior arts and that of the present application are the same. A reference with is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. Inherency is not established by probabilities or possibilities. *In re Robertson*, 49 USPQ2d 1949 (1999).

As to Claim 5, Shimamura et al. discloses wherein the amount of carbon material is 1 wt% or more and 10 wt% or less (paragraph [0018]).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ADAM A. ARCIERO whose telephone number is (571)270-5116. The examiner can normally be reached on Monday to Friday 8am to 5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on 571-272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AA

/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1795